Application No.: 09/601,515 Docket No.: 20162-00564-US

AMENDMENTS TO THE CLAIMS

This listing of the claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) An acoustic effect apparatus for boosting an output signal of a bass musical instrument comprising

an input for receiving the output signal of the bass musical instrument;

bandpass filter means coupled to the input for selecting a frequency band of the audio signal;

distortion applying means coupled to the bandpass filter means for applying a non-linear distortion to the selected frequency band signal;

adding means coupled to the input and the distortion applying means for deriving a sum of the input audio signal and the output signal from the distortion applying means; wherein

said bandpass filter means has a low frequency cut-off frequency which is in a range of 50 to 300Hz, and a high frequency cut-off frequency which is in a range of 200 to 450Hz and passes only a double-numbered overtone component of the desired fundamental tone of the bass musical instrument and suppresses the signal frequencies lower than or equal to the fundamental tone as well as the signal frequencies above the double-numbered overtone thereby selecting [for picking out] components corresponding to the double-numbered overtone [regions] component [of a bass musical instrument such as a base or a bass drum from an audio signal which is input from an input terminal];

[and] said distortion applying means having an S-shaped non-linear input-output response defined by a curve which has no point symmetry with respect to a reference point of an input and an output function and applies [receiving the components corresponding to the double overtone regions which are picked out by the filter means and applying a] non-linear distortion to the components thus passed by the band-pass filter means to thereby generate harmonics of [corresponding to the] double-numbered overtone [regions] frequencies, thereby

boosting the even-numbered overtone of the fundamental tone of the bass musical instrument.

2. (Currently Amended) An acoustic effect apparatus according to Claim 1 in which the filter means has a cut-off frequency response on the bass side which has a frequency response [is gentle enough] to allow a fundamental tone component of the bass musical instrument to be delivered [even though subject to] at a reduced level [reduction].

3 (Currently Amended) An acoustic effect apparatus according to Claim 2 in which the cut-off frequency response on the bass side of the filter means is chosen to be on the order of +12dB/OCT.

4. (Currently Amended) An acoustic effect apparatus according to Claim 1 in which the filter means has a cut-off frequency response on the higher pitch side which is steeper than the cut-off response on the bass side.

5. (Currently Amended) An acoustic effect apparatus according to Claim 4 in which the cut-off frequency response on the higher pitch side of the filter means is on the order of - 24dB/OCT or steeper.

6. Cancelled

7. (Original) An acoustic effect apparatus according to Claim 6 in which the filter means has a cut-off frequency on the bass side which is substantially equal to 200Hz and a cut-off frequency on the higher pitch side which is substantially equal to 400Hz.

8. (Currently Amended) An acoustic effect apparatus according to one of Claims [1 to 7] 1, 2, 3, 4, 5 or 7 in which the filter means comprises a high pass filter having a cut-off frequency which is equal to the cut-off frequency on the bass side, and a low pass filter having a cut-off frequency which is equal to the cut-off frequency on the higher pitch side.

9. (Currently Amended) An acoustic effect apparatus according to Claim 8 in which the high pass filter frequency response has a small peak formed on a shoulder located adjacent to the cut-off frequency of its amplitude-frequency characteristic curve.

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10. (Currently Amended) An acoustic effect device according to one of Claims [1 to 7] 1, 2, 3, 4, 5 or 7 in which the filter means comprises a bandpass filter.

11. (Currently Amended) An acoustic effect device according to one of Claims [1 to 7] 1, 2, 3, 4, 5 or 7, further comprising means for changing the cut-off frequency of the filter means.

12. Cancelled

13. Cancelled

14. (Currently amended) An acoustic effect apparatus according to Claim [13] 1 in which the distortion applying means comprises a transistor having a collector, to which an output from the filter means is fed, and an emitter which delivers an output signal, and means for setting up a base current of the transistor, the distortion applying means utilizing a non-linear response occurring adjacent to the zero point of the collector current-collector-emitter voltage response of the transistor.

15. (Original) An acoustic effect apparatus comprising

a narrow-bandpass filter for [picking out] selecting a double overtone component of a desired fundamental tone of a bass musical instrument from an audio signal [which is input from an input terminal];

and distortion applying means for receiving the double overtone component which is [picked out] selected by the narrow-bandpass filter [for] and applying a non-linear distortion to the double overtone component.

16. (Currently Amended) An acoustic effect apparatus according to Claim 15 in which the narrow-bandpass filter has a low frequency cut-off response [on the bass side] which is chosen on the order of +12dB/OCT.

17. (Currently Amended) An acoustic effect apparatus according to Claim 15 in which the distortion applying means has an input-output response which is S-shaped [with respect to a rectilinear line representing a linear response and which is defined by a curve] having no point symmetry with respect to a reference point of an input and an output function.

18. (Currently Amended) An acoustic effect apparatus comprising

a high pass filter for [picking out] selecting a component corresponding a double or higher overtone of a bass musical instrument from an audio signal [which is input from an input terminal];

and distortion applying means for receiving the component corresponding to the double or higher overtone [which is picked out by the high pass filter] and for applying a non-linear distortion to the component corresponding to the double or higher overtone;

the distortion applying means having an input-output response which is a non-linear response having no point of symmetry with respect to the center of an input amplitude.

19. (Currently Amended) An acoustic effect apparatus according to Claim 18 in which the non-linear response [is an input-output response which] is S-shaped [with respect to a rectilinear line representing a linear response and which is defined by a curve] having no point of symmetry with respect to a reference point of an input and output function.

20. (Currently Amended) An acoustic effect apparatus according to Claim 18 in which the high pass filter has a cut-off frequency response which is substantially equal to +12dB/OCT and has a cut-off frequency of about 200Hz.

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21. (Currently Amended) An acoustic effect apparatus according to Claim 18 in which the high pass filter frequency response has a small peak formed on a shoulder located adjacent to a cut-off frequency of its amplitude-frequency characteristic curve.

22. (Currently Amended) An acoustic effect apparatus according to one of Claims [1 to 7 and 12 to 21] 1, 2, 3, 4, 5, 7, 12, 13, 14, 15, 16, 17, 18, 19, 20 or 21, further comprising a summer for summing an output signal from the distortion applying means and the input audio signal from the input terminal for delivery to an output terminal.

23. (Currently Amended) An acoustic effect apparatus according to Claim 22, further comprising a low pass filter which is fed with an output signal from the distortion applying means and which [provides a gentle attenuation of] attenuates as a function of frequency signal components substantially equal to or greater than 200Hz before feeding the summer.

24. (Currently Amended) An acoustic effect method comprising

a step of [picking out] selecting a component corresponding to a double overtone frequency region of a bass musical instrument such as a [base] bass or a bass drum from an input audio signal [from an input terminal] by means of filter means;

and a step of applying a non-linear distortion to the component corresponding to the double overtone region [which is picked out] by means of distortion applying means.

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25. (Original) An acoustic effect method according to Claim 24, further comprising a step of summing the double overtone region component to which the non-linear distortion is applied and the input audio signal together for delivery.

26. (Currently Amended) An acoustic effect method according to Claim 24 or 25 in which the filter means has a low frequency cut-off frequency [on the bass side] which is substantially equal to 200Hz and has a low frequency cut-off response which is substantially equal to +12dB/OCT, a high frequency cut-off frequency [on the higher pitch side which is] substantially equal to 400Hz and a high frequency cut-off response which is steeper than substantially -24dB/OCT.

27. (Currently Amended) An acoustic effect method according to Claim 26 in which the distortion applying means has an input-output response which is a non-linear response having no point symmetry with respect to the center of an input signal amplitude.

28. (Currently Amended) A recorded medium having a program recorded thereon for execution by a computer of an acoustic effect apparatus, the program including instructions for:

[a] processing for downloading audio data;

[a] filter processing for [picking out] selecting a component of data from said audio data corresponding to double overtone region of a bass musical instrument such as a [base] bass or a bass drum from the downloaded audio data;

and a distortion applying processing which applies a non-linear distortion to the component data corresponding to the selected double overtone region [which is picked out].

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29. (Currently Amended) A recorded medium according to Claim 28 in which the filter processing is a processing with a cut-off frequency response at +12dB/OCT at a low frequency cut-off [frequency on the bass side] which is anywhere in a range of 50 ~ 300Hz and with a cut-off frequency response at -24dB/OCT or steeper at a high frequency cut-off frequency [on the higher pitch side] which is anywhere in a range of 200 ~ 450Hz.

30. (Currently Amended) A recorded medium according to Claim 29 in which the filter processing has a low cut-off frequency [on the bass side] which is substantially equal to 200Hz and a high cut-off frequency [on the higher pitch side] which is substantially equal to 400Hz.

31. (Currently Amended) A recorded medium according to one of Claims [28 to 30] 28, 29 or 30 in which the filter processing comprises a high pass filter processing with a low cut-off frequency and a low cut-off frequency response [on the bass side] and a low pass filter processing with a low cut-off frequency and a low cut-off frequency response [on the higher pitch side].

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32. (Currently Amended) A recorded medium according to Claim 28 in which the distortion applying processing is a processing having an input-output response which is a non-linear response having no point symmetry with respect to the center of an input signal amplitude.

33. (Currently Amended) A recorded medium according to one of Claims 28, 29 and 32 in which the distortion applying processing [is a processing in which a reference is made] refers to a table having non-linear input-output responses recorded therein in terms of the component data corresponding to the double overtone region which is [picked out] selected to deliver output data.

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34. (Currently Amended) A recorded medium according to one of Claims 28, 29 and 32 in which the distortion applying processing [is a processing which] calculates a non-linear function using a variable defined by a component data corresponding to the double overtone region which is [picked out] selected to deliver output data.

35. (Currently Amended) A recorded medium according to one of Claims 28, 29 and 32 in which the program includes a program which causes the computer to execute a low pass filter processing [which causes the level to be gradually reduced for] gradually reducing the component data corresponding to the double overtone region to which the non-linear distortion is added as the component data [goes toward the higher pitch] increases an frequency.